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TRANSPORTATION TEST WITH CANTALOUPS, BRAWLEY, CALIFORNIA TO NEW YORK CITY, JUNE 7-16, 1947

By

W. T. Pentzer, Senior Physiologist
D. H. Dewey, Assistant Physiologist
E. P. Atrops, Assistant Chemist
J. Kaufman, Junior Pathologist

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TRANSPORTATION TEST WITH CANTALOUPS,
BRAWLEY, CALIFORNIA TO NEW YORK CITY, JUNE 7-16, 1947

The purposes of this transportation test with cantaloups were (1), to compare the performance of overhead bunker cars and fan cars, and (2), to compare the refrigeration obtained from different amounts of ice in top-iced cars. The cars included in the test are shown in Table 1.

COMPARISON OF OVERHEAD BUNKER CARS AND FAN CARS

Methods of loading and refrigeration

Arrangements were made with the shippers to load the fan cars C and D with approximately the same number of crates as in overhead bunker cars A and B even though this called for loading 9 stacks four high instead of all of the stacks three high as in the overhead bunker cars. The billing weights of these four cars were approximately the same, about 26,700 pounds in each car. This meant that the heat load to be contended with in transit was about the same in all of these cars. To make the four cars further comparable in this respect, they were all precooled with mechanically refrigerated units to nearly the same average temperature, the final temperatures ranging from 54 to 57°F.

The salting practices used for the overhead bunker cars were those suggested by the Standard Railway Equipment Company. The fan cars were salted in the same manner as the overhead basket bunker car except as noted in table 2. The chief difference in the salting practice followed in this test as compared with earlier ones was that the amount added to overhead basket bunker and fan cars at the first replenishment was based on the ice supplied and not on bunker capacity. In earlier tests where the latter method was followed the end bunker cars, which have 11,500 pounds ice capacity received heavier salting than the overhead bunker cars that hold only 9,500 pounds of ice. Since the overhead brine tank car (Car A) has less cooling surface than cars equipped with basket bunkers that permit access of air to the ice, it was purposely salted much more heavily. At the first replenishment after loading this car received 1,200 pounds of salt, or 12-1/2 percent of the bunker capacity. At the next icing station, Yuma, Arizona, 480 pounds of salt was used, or 16 percent of the amount of ice supplied. The overhead basket bunker car (Car B)

was given enough salt to equal 5 percent of the ice supplied for replenishment after loading, and because the melons were somewhat ripe in this car, it was salted to the extent of 8 percent of the ice supplied at the second re-icing station, Yuma, Arizona. Both of the fan cars (C and D) received salt equal to 5 percent of the ice supplied at the first and second re-icings and, as noted, were not salted as heavily at the second icing station as the overhead bunker cars. Salting was discontinued in all cars at Yuma since at this time the fan cars had temperatures low enough for the hard-ripe melons loaded in them. At each icing station particular care was taken in the icing of the overhead bunker cars to see that the ice was pushed back into the bunkers and that they were filled to capacity. Because of the special attention this required there is no doubt that these cars were iced better than they would have been in normal practice with crews not accustomed to icing this kind of car.

One of the drive pulleys of fan car D ceased to operate between Dalhart, Texas and Kansas City, Kansas, thus the fans in the end of the car opposite the test end, were not operated during the rest of the trip. Despite the fact that the brine valves were closed in the overhead tank car not more than an inch or two of the brine was retained in the tanks.

Temperatures were taken in the cars by means of distant reading electric resistance thermometers. Air temperatures were obtained at the top and bottom bulkhead opening in the end-bunker fan cars; and in the overhead bunker cars at the ceiling and beneath the floor-racks at the sidewall. The temperatures of an exposed melon in the bottom layer next to the bunker or sidewall were taken to guard against freezing damage from over salting. Nine melon temperatures were taken along the centerline of the car, in the bottom, middle and top layers of the bunker, quarterlength, and doorway stacks. The center melon of the crate was used for this purpose. An average of the temperatures at these positions represents the average temperature of the load very closely. They were also used to obtain average temperatures of the different layers. Recording thermometers were installed at the ceiling of all four cars to give a continuous record of inside air temperatures; outside air temperatures were obtained by attaching recording thermometers to the undercarriage of the cars.

All of the cars were routed via S.P., Rock Island, B.R. of C., and Erie but one car was diverted at Kansas City via the Wabash and B. and O. It was met at New York for final temperature readings. The schedule of the test train and weather encountered are shown in Table 3.

Results; overhead bunker cars and fan cars

The temperatures obtained in the cars equipped with overhead bunkers and in end bunker fan cars are shown in figures 1 to 4 respectively and a closer comparison of the three types of cars is made in figures 5 to 8. Temperatures of top, middle and bottom layers were uniform in all four cars. The fan cars held the melons at a lower temperature in transit than the overhead bunker cars.

The main reason for again comparing overhead bunker cars and fan cars was to find if the former type was capable of cooling melons as fast in transit as the fan car, when salted according to the amount of ice added and with comparable loads of melons. These conditions did not prevail in our earlier tests. The results show that the fan cars cooled the melons in top, middle and bottom layers faster than the overhead bunker cars. The run between Yuma and Tucson, which was a fairly fast one was particularly effective in cooling the melons in the top layer of the fan cars (Figure 5). From then on to New York melons in top layer of the fan cars were as much as 3 or 4 degrees cooler than in the top layer of the overhead bunker cars. The middle layer of the fan car had a lower temperature than this layer of the overhead bunker cars by the time the train reached Yuma, and maintained this advantage during the rest of the trip (Figure 6). The bottom layer of the fan car cooled quickly while the cars were standing in Brawley and was about 4° lower at Yuma than the bottom layer of the overhead basket bunker car and 6° lower than this part of the load in the overhead tank car (Figure 7).

The average temperatures of the loads are shown in figure 8. The heavy salting of the overhead tank car had the desired effect of increasing its capacity for cooling. It had about the same or even lower temperatures than the overhead basket bunker car for the first 5 or 6 days in transit and about the same temperature during the rest of the trip. This was in direct contrast with results of our earlier tests when overhead tank cars made a much poorer showing. However, despite the use of as much as 1,200 pounds of salt with the first replenishment in the overhead tank car, 36.7°F. was the lowest air temperature recorded and this was at Yuma, Arizona after the second salting. An exposed "test" melon adjacent to the outlet of the bunker in this car was only 37.2° at this time.

The icing and salting records of the cars are shown in table 2. Ice and salt were weighed into cars A, B, C, and D except when noted otherwise. The amount of ice consumed ranged from approximately 15,000 pounds for fan car D and overhead tank car A to 20,000 pounds for fan car C, which had an additional day in transit. Not as much ice was required as in our earlier tests when melons were warmer at time of loading and higher outside temperatures prevailed. The

latter part of the trip from Dalhart, Texas to New York was cool and rain or cloudy weather prevailed. Temperatures of 100°F. or over were encountered during the first 3 days en route (Figure 1).

COMPARISON OF TOP-ICED CARS

Four cars top-iced with different amounts of ice were included (table 1). A car top-iced followed by short precooling to melt off the top ice (Car E) was compared with the conventional method of top-icing (Car G) and with a top-iced fan car (Car F). An additional car was included in which a small amount of top-ice (3,600 pounds) was tried in lieu of short precooling for hard-ripe melons, that needed some color development in transit (Car H). All of these cars were loaded with the usual 312 crates or equivalent, to make a load slightly in excess of the 24,000 pound minimum. Car G was an exception for it had a load a few hundred pounds less than 24,000 pounds. Temperatures of melons and air were obtained with electric resistance thermometers, as in the other four cars described above.

Results; top-iced cars

As far as temperatures were concerned, top-icing with only 4,500 pounds of ice and melting it off by precooling (Car E, figure 9) gave poorer results than top-icing in the usual manner with 28 or 35 blocks, the amount of ice used depending on the temperature of the melons (Cars F and G, figures 10 and 11 respectively). Top layers were warmer in top-iced precooled car E than in either of the other two top-iced, non-precooled cars F and G and the melons were less uniform in temperature throughout the load. All the ice was melted from the load in Car E at the end of 4 hours precooling, in which no refrigeration was used during the first 2 hours. Salting of this car with 2 percent of the bunker capacity at Brawley and 2 percent of ice supplied at Yuma resulted in low bottom layer temperatures during the first 2 days in transit. Bottom air reached 29°F. at Yuma indicating that the car had received about as much salt as was safe to use. If the car had been heavily top-iced no salt should have been used for without it bottom layer melons reached 33°F. (Figure 10).

The temperatures in the top-iced fan car and the top-iced standard car (Cars F and G, Figures 10 and 11 respectively) were very similar. In other tests, the fan car has given lower temperatures during the latter part of the trip than the standard car; in this test some top ice was still left in the heavily top-iced standard car when unloaded in New York and this probably accounts for temperatures in it being equal to those in the fan car.

The use of a small amount of top ice, 3,600 pounds in lieu of moderate precooling of hard-ripe melons (Car H) gave temperatures of 50° in top layers by the time the car reached Yuma, Arizona and 45° at

Tucson and close to 40° thereafter (Figure 12). These temperatures permitted some ripening of the melons but were too low to permit a desirably yellowish color to develop. Earlier work shows that very short precooling or none at all without top-icing would have given more desirable temperatures for ripening melons of this stage of maturity during the 6 day trip to Chicago.

Inspection of top-ice in transit

The four top-iced cars were inspected at Tucson, Arizona for the amount of top-ice left on the load. Car E, top-iced and precooled, had none on it since it was melted off at loading point and the melons were fairly dry. Lightly top-iced car H also had no top-ice left; most of it was gone within 4-1/2 hours after top-icing. Car G, top-iced with 10,500 pounds, had patches of top-ice left over about half of the load. When inspected at Dalhart there was still about 100 pounds left on top of the load and when unloaded in New York, approximately 100 pounds of ice was left in the channels next to the bulkhead. The temperature of the melons in this car would have required about 9,600 pounds of top-ice, for removal of field heat, etc. and as indicated about 900 pounds additional was used which was probably not needed. Fan car F had small patches of top-ice left on the load at Tucson, Arizona; at Dalhart, Texas about 100 pounds was left on the leeward side of the crates in the breakdown end of the load and the rest of the load was bare. There was no top-ice left when the car was unloaded in New York.

The icing records for the four top-iced cars E, F, G and H are shown in table 2. The ice consumed including top-ice amounted to about 20,500 pounds in the heavily top-iced standard car G, approximately 19,800 pounds in the top-iced fan car F, 16,500 pounds in the top-iced precooled car E and 13,000 pounds in the lightly top-iced car H shipped to Chicago. These cars did not require as much bunker ice as did the non-top-iced cars A, B, C and D. They needed 9,400 to 12,000 pounds as compared with 15,000 to 20,000 pounds in the latter cars.

Inspection of melons in overhead bunker cars, fan cars and top-iced cars

The commercial practice is to load the "choice" (ripest) melons in cars for top-icing and the less fully colored "hard-ripe" melons in cars that are to be precooled. There were two exceptions to this in the test cars (table 4). Overhead bunker car B, which was precooled was loaded with yellowish colored choice melons and lightly top-iced car H was loaded with hard-ripe melons, as was indicated in the outline of the test. The melons were in good condition in all of the cars when they were unloaded. No decay of any consequence was found. The yellowish colored melons were much in favor with the buyers and in this respect the cars of ripe melons were preferable. The hard-ripe melons changed only slightly in color in transit. None were objectionably green.

The melons were not objectionably wet in any of the top-iced cars and the melons not top-iced soon became wet from condensation after removal from the car so that it was hard to distinguish one shipment from another with respect to wetness except for the crates being more wet in top-iced cars. The melons from the top-iced fan car were in the same condition as those from the top-iced standard car in respect to wetness and tightness of pack. Likewise, melons from the precooled top-iced car appeared to be no drier than those from any other car. As indicated, condensation soon formed on all melons when removed from the cars.

Acknowledgments

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Table 1. List of test cars and method of loading and refrigeration

Car	Design	Refrigeration used	Number of crates, billing weight	Loading period	Shipper
PFE					
A- 79997	Overhead tanks	Precooled to 54° F., std. ref. salted, 12-1/2 percent bunker capacity Brawley, 16 percent ice added Yuma.	342 jumbo crates 26,676 pounds	8:45 to 11:00 a.m.	Jack Bros. & McBurney
B- 79998	Overhead baskets	Precooled to 56° F., std. ref. salted 5 percent Brawley, 8 percent Yuma of ice supplied.	246 jumbo crates 112 standard crates 26,804 pounds	9:05 to 10:00 a.m.	Western Fruit Growers
C- 64623	Fan Car	Precooled to 57° F., std. ref. salted 5 percent Brawley and Yuma of ice supplied.	342 jumbo crates 26,676 pounds	9:05 to 10:05 a.m.	American Fruit Growers
D- 65778	Fan Car	Precooled to 56° F., std. ref., salted 5 percent Brawley and Yuma of ice supplied.	294 jumbo crates 49 standard crates 12 jumbo flats 26,648 pounds	9:00 to 11:00 a.m.	S. A. Gerrard Co.
E- 62536	Standard car	Top iced with 4,500 pounds, ice melted off with trackside precooler, 48° F. at finish, std. ref. salted 2 percent bunker capacity Brawley, ice supplied Yuma.	234 jumbo crates 91 standard crates 6 jumbo flats 24,632 pounds	8:30 to 11:00 a.m.	S. A. Gerrard Co.
F- 64299	Fan Car	Top iced with 8,400 pounds according to temperature of load - std. ref.	182 jumbo crates 140 standard crates 24,496 pounds	9:30 to 11:00 a.m.	Fred V. Hilvert Co.
G- 44886	Standard Car	Top iced with 10,500 pounds slightly in excess of requirements for load temperature - std. ref.	234 jumbo crates 28 standard crates 63 pony crates 23,747 pounds	1:10 to 2:10 p.m.	A. Arena Co.
H- 63115	Standard Car	Hard-ripe melons top iced lightly, 3,500 pounds, std. ref.	232 jumbo crates 35 standard crates 24,376 pounds	10:30 a.m. to 2:00 p.m.	H. F. Murphy Co.

Table 2. Icing and salting records U.S.D.A. Cantaloup Test-1947-1

Station	Date	Time	Car A[1] PFE 79999 Overhead Tanks		Car B[1] PFE 79998 Overhead Baskets		Car C[1] PFE 64623 Fan Car		Car D[1] PFE 65778 Fan Car		Car E PFE 62586 Std. car Top-iced Precooled		Car F PFE 64299 Fan Car Top-iced	Car G PFE 44880 Std. car Top-iced	Car H PFE 63115 Std. Car Light Top ice
			Ice	Salt	Ice	Salt	Ice	Salt	Ice	Salt	Ice	Salt	Ice	Ice	Ice
	June		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Brawley Calif. (Initial)	6	9:00 p.m. to 12:00 p.m.	9,265	None	11,247	None	11,337	None	11,132	None	11,500	None	11,500	11,500	11,500
Brawley Calif. (Top Ice)	7	11:30 a.m. to 2:30 p.m.	None	do.	-----	do.	-----	do.	-----	do.	4,500	do.	8,400	10,500	8,600
Brawley Calif. (Replenish)	7	9:40 p.m. to 11:30 p.m.	1,265	1,200	4,440	220	2,023	150	2,337	180	2,300	230	2,100	2,100	2,400
Yuma Arizona	8	1:30 p.m. to 3:00 p.m.	3,006	480	2,976	240	2,413	120	2,355	120	1,800	36	800	900	1,200
Tucson Arizona	9	7:30 a.m. to 9:00 a.m.	3,432	None	1,716	None	2,288	None	2,002	None	1,430	None	1,140	1,140	1,800
El Paso Texas	9	10:35 p.m. to 11:30 p.m.	1,081	do.	900	do.	1,520	do.	1,112	do.	800	do.	800	800	700
Dalhart Texas	11	4:20 a.m. to 5:00 a.m.	770	do.	1,580	do.	1,585	do.	1,690	do.	1,400	do.	1,700	1,400	1,500
Kansas City Kans.	12	1:00 a.m. to 2:10 a.m.	1,189	do.	1,375	do.	2,313	do.	1,517	do.	1,300	do.	1,400	1,100	1,500

Table 2. (continued)

Station	Date	Time	Car A 1/ PFE 79999 Overhead Tanks		Car B 1/ PFE 79998 Overhead Baskets		Car C 1/ PFE 64623 Fan car		Car D 1/ PFE 65778 Fan car		Car E PFE 62586 Std. car Top-iced Precooled		Car F PFE 64299 Fan car Top-iced	Car G PFE 44886 Std. car Top-iced	Car H PFE 63115 Std. car Light Top Ice
	June		Ice lbs	Salt lbs	Ice lbs	Salt lbs	Ice lbs	Salt lbs	Ice lbs	Salt lbs	Ice lbs	Salt lbs	Ice lbs	Ice lbs	Ice lbs
Silvis Ill.	12	1:00 a.m. to 2:10 a.m.	875	None	1,600	None	DIVERTED 2/ Kansas City		850	None	400	None	400	400	500
Clearing Ill.	13	9:05 a.m. to 9:50 a.m.	702	"	920	"	1,600 3/		516	"	800	"	800	500	Chicago dest.
Marion Ohio	14	2:15 a.m. to 2:45 a.m.	875	"	1,513	"	2,300 4/		756	"	600	"	500	500	
Hornell New York	15	8:00 p.m. to 8:25 p.m.	720	"	841	"	1,900 5/		1,012	"	500	"	1,000	450	
TOTAL SUPPLIED			23,880	1,680	29,108	460	30,239	270	25,429	240	27,330	266	30,540	31,290	24,500
Ice left Croxton Yds.			8,600		10,300		10,000		10,500		10,800		10,700	10,800	11,500 6/
Total used			15,280	1,680	18,808	460	20,239	270	14,920	240	16,530	266	19,840	20,490	13,000

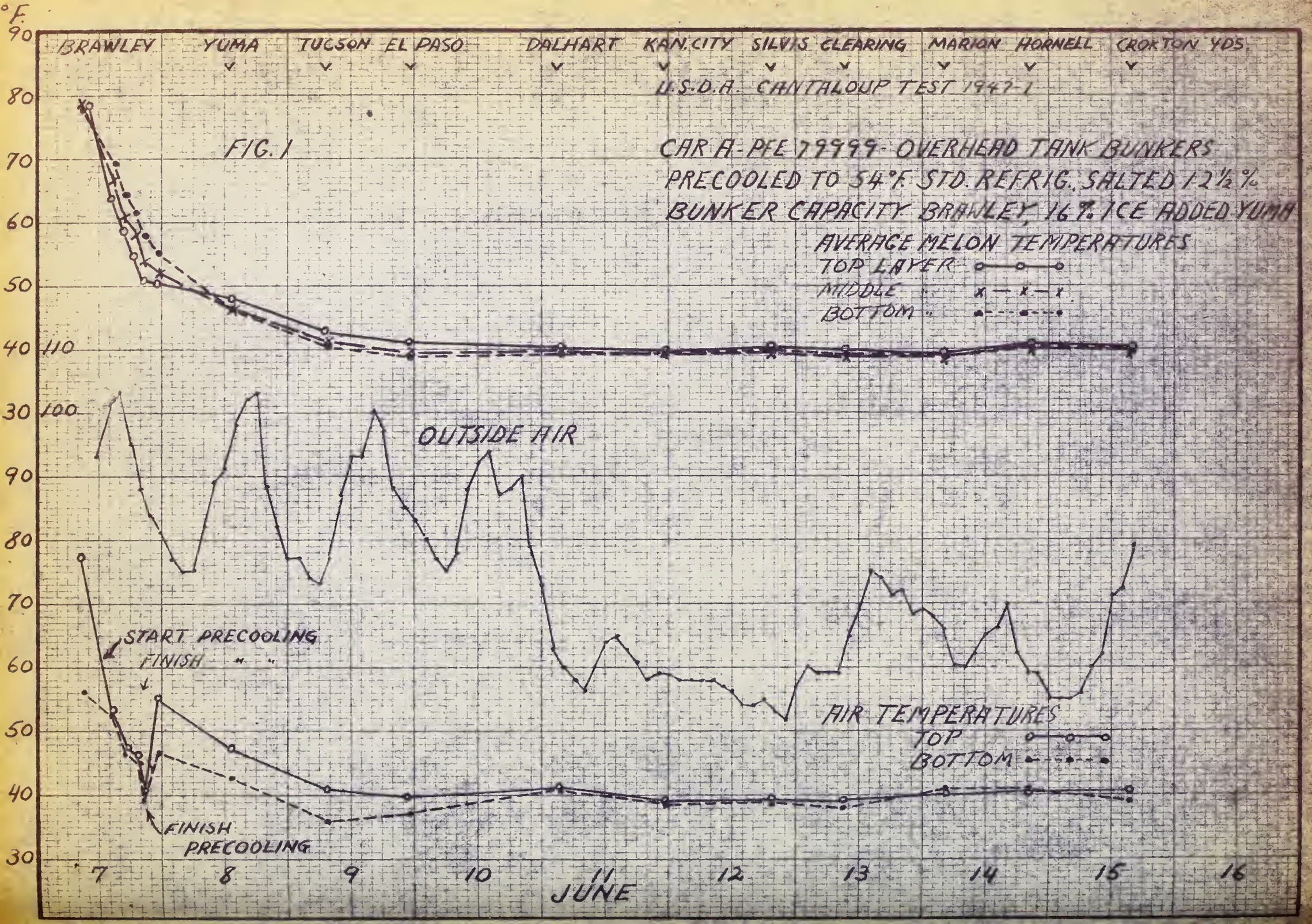
1/ Ice and salt weighed into these cars; in the others, estimated.
2/ Ice estimated from Kansas City to New York, N.Y.
3/ East St. Louis, Ill. 2:05 p.m., 6/13
4/ Cincinnati, Ohio 11:05 a.m. 6/14
5/ Cumberland, Md. 6/15
6/ Ice left at Silvis, Illinois

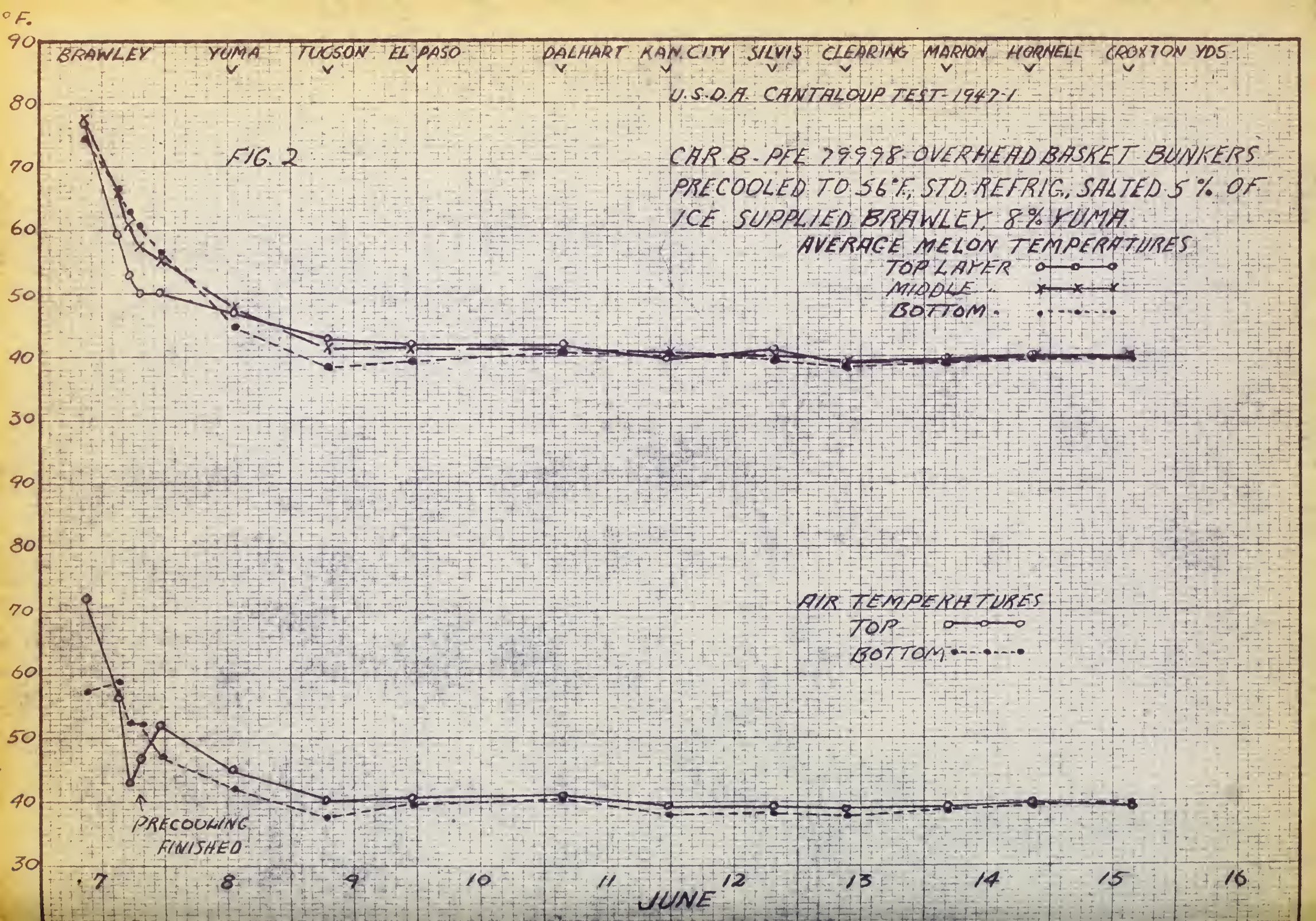
Table 3. Schedule of test train and weather enroute.

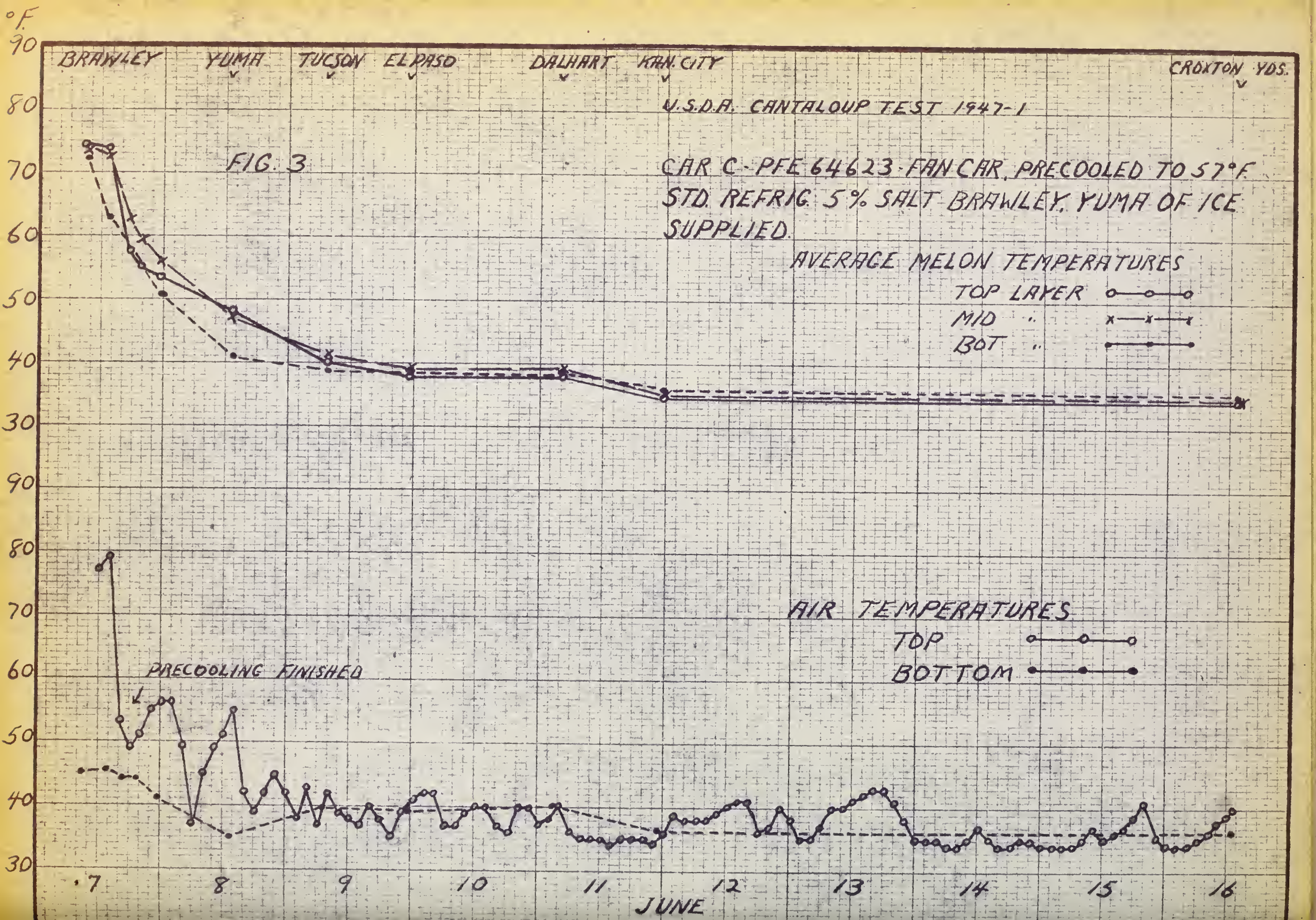
Place	Arrival	Departure	Weather
Brawley, Calif.		June 8 - 2:00 a.m.	Clear
Yuma, Ariz.	June 8 - 8:00 a.m.	8 - 3:30 p.m.	"
Tucson, Ariz.	8 - 7:00 a.m.	9 -10:00 a.m.	"
El Paso, Texas	8 -10:20 p.m.	10 - 4:15 a.m.	"
Dalhart, Texas	11 - 2:35 a.m.	11 - 5:20 a.m.	Cloudy
Kansas City, Kansas	11 -10:45 p.m.	12 - 5:10 a.m.	Raining
Silvis, Ill.	12 - 7:05 p.m.	12 -10:00 p.m.	Cloudy
Clearing, Ill.	13 - 8:45 a.m.	13 -11:55 a.m.	"
Hammond, Ind.	13 - 1:45 p.m.	13 - 3:25 p.m.	"
Huntington, Ind.	13 - 7:45 p.m.	13 - 8:50 p.m.	"
Marion, Ohio	14 - 2:10 a.m.	14 - 4:50 a.m.	Raining
Kent, Ohio	14 - 9:05 a.m.	14 - 9:35 a.m.	Cloudy
Meadville, Pa.	14 -12:35 p.m.	14 -12:55 p.m.	"
Salamanca, N.Y.	14 - 4:35 p.m.	14 - 4:50 p.m.	Raining
Hornell, N.Y.	14 - 7:55 p.m.	15 - 2:50 a.m.	Cloudy
Port Jervis, N.Y.	15 -11:20 a.m.	15 -12:15 p.m.	"
Croxton Yds., N.J.	15 - 3:25 p.m.		

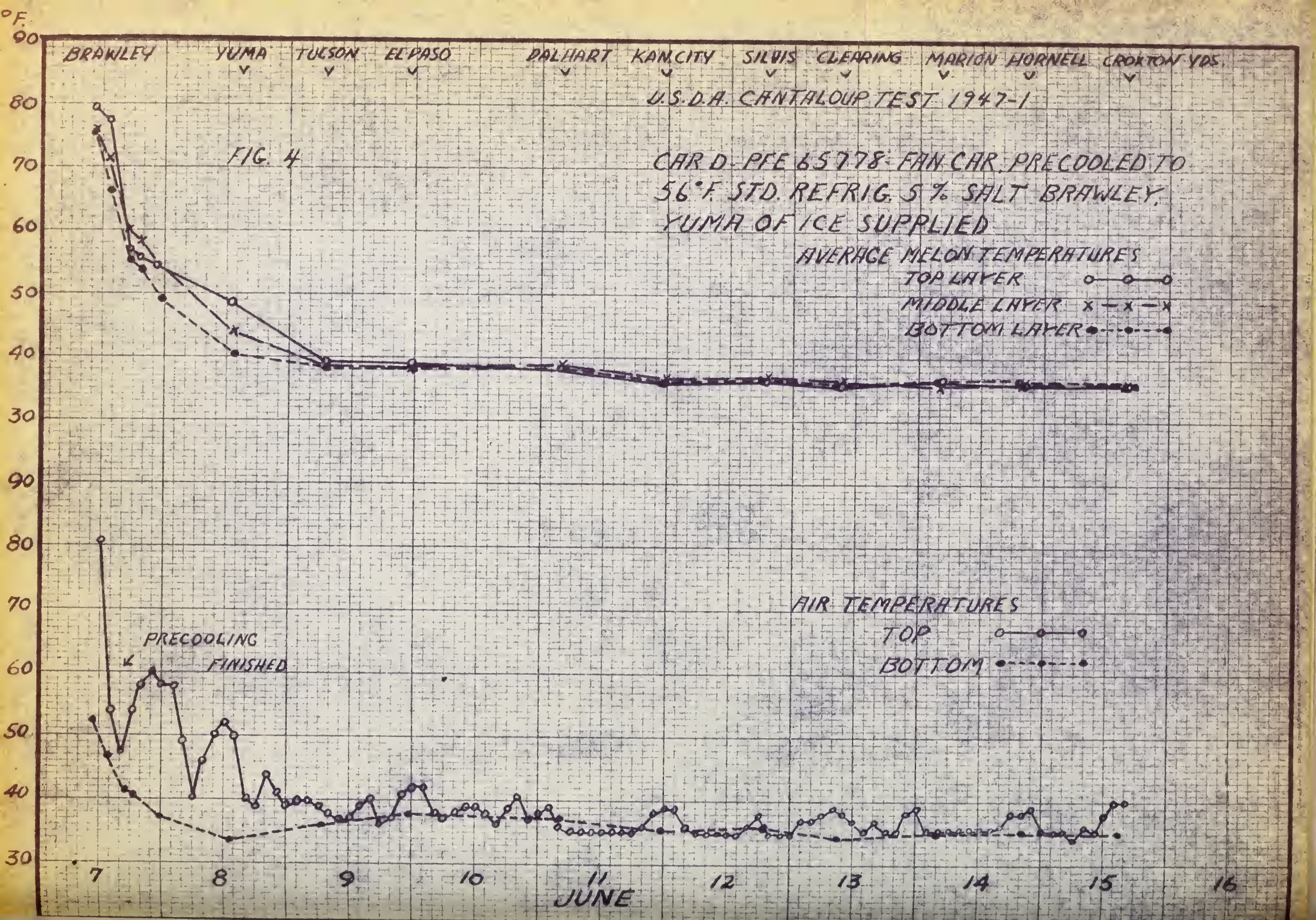
Table 4. Inspection of cantaloups in test cars

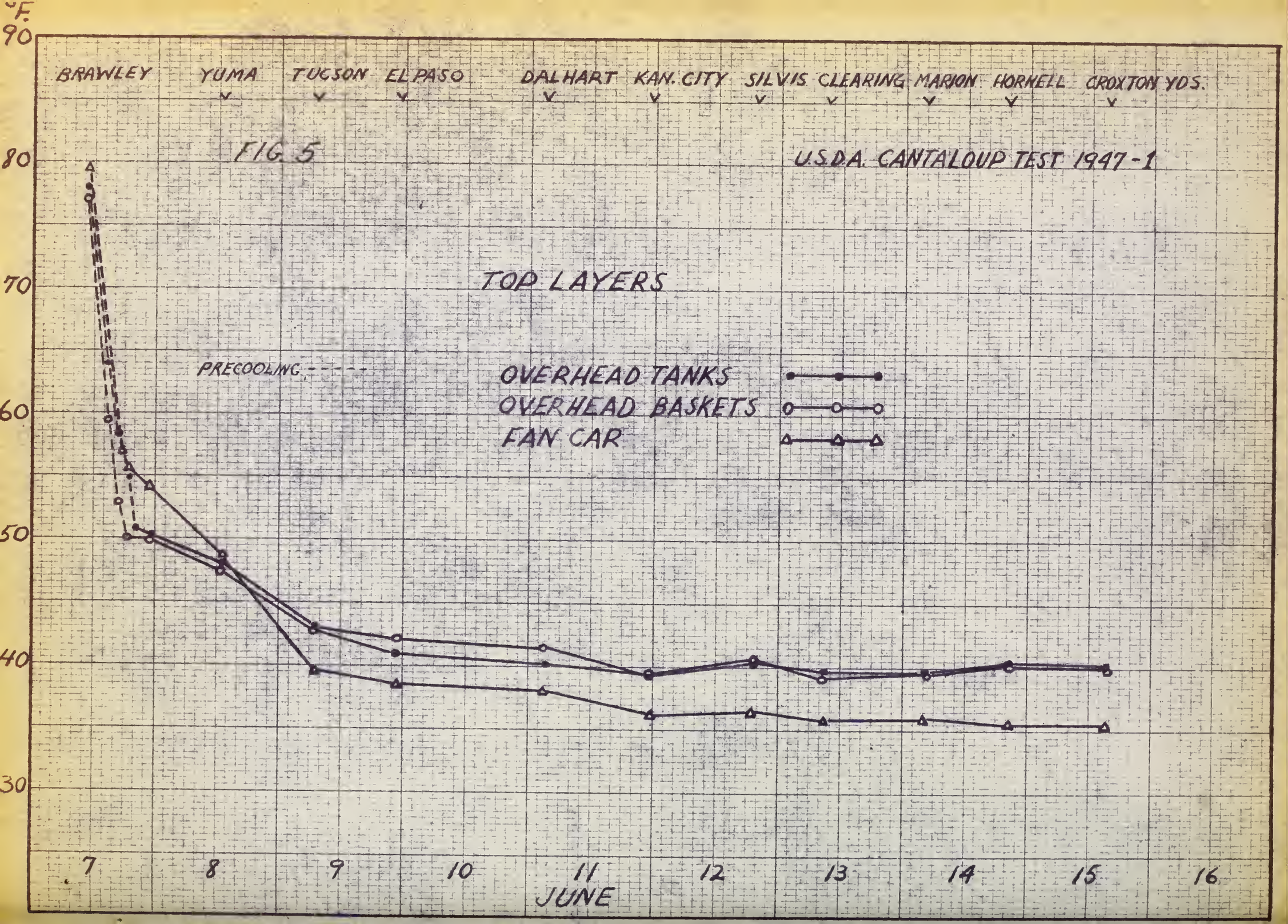
Car	Refrigeration	Maturity when shipped	Conditions when unloaded
A	Overhead tank bunkers, precooled PFE 79999	Commercial hard ripe, yellow green ground color, sutures green, melons firm, mostly V-1 variety.	June 16 - Color distinctly yellow green sutures green, slight color change in transit, melons firm to soft, no decay.
B	Overhead basket bunkers, precooled PFE 79998	Classed as commercial choice, distinct yellowish color on most melons, firm ripe maturity, variety 5 and 6.	June 16 - High color, many yellow, but sound, firm ripe, no decay, color liked by trade especially small stores for immediate consumption.
C	Fan car, precooled PFE 64623	Commercial hard ripe, yellowish green ground color, sutures green, melon firm, variety 6.	June 16 - Many melons still yellowish green, little change, firm to firm ripe, fairly uniform, no decay, attractive.
D	Fan car, precooled PFE 65778	Commercial hard ripe, yellowish green, ground color, sutures green, melons firm, variety mixed.	June 15 - Distinctly more yellowish green than companion car E, not objectionable, firm ripe, no decay.
E	Std. car, top-iced lightly, melted off PFE 62586	Commercial choice, distinct yellowish color on most melons, firm ripe maturity, a ripe car of melons, variety mixed.	June 15 - Distinct yellow color, attractive, buyer pleased, firm ripe to firm, one of highest colored cars on display. No decay.
F	Fan car, top-iced 8,400 pounds PFE 64299	Commercial choice, yellow to greenish yellow, firm ripe maturity.	June 15 - Color yellowish, about right, very uniform, a little less yellow color than some buyers like. Firm ripe, no decay.
G	Std. car, top-iced 10,500 pounds PFE 44886	Commercial choice, yellow to greenish yellow, mostly firm ripe maturity, variable.	June 15 - Melons in pony crates at doorway yellow, ripe, but sound, rest of load not as ripe, variable, generally desirable, no decay.
H	Std. car, top-iced lightly PFE 63115	Commercial hard ripe, yellow green ground color, sutures green - not high color	June 12 (Chicago) - Melons still not as well colored as desired, sutures green on some melons, temperature too low for much ripening.

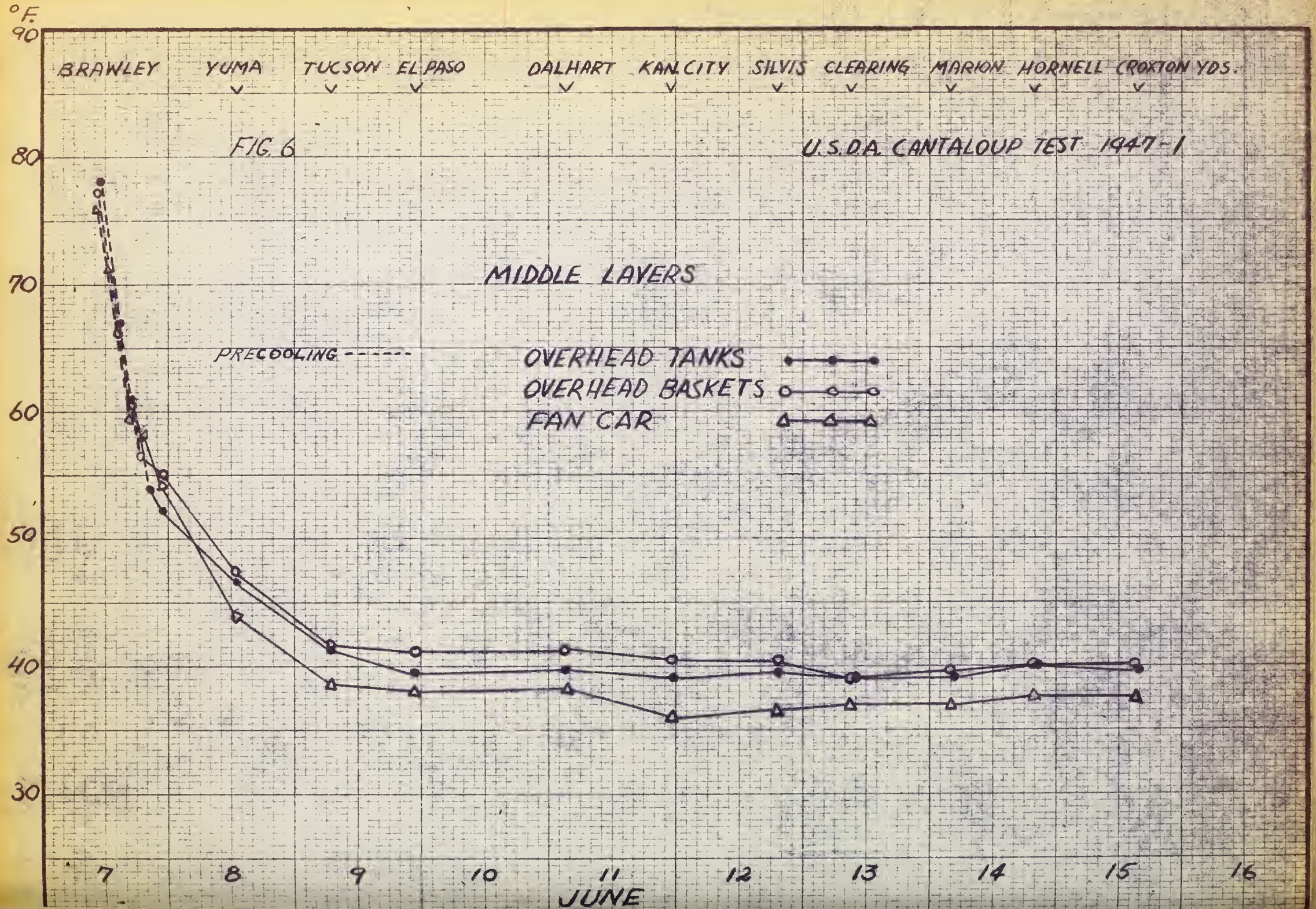

°F.
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROKTON YDS.
U.S.D.A. CANTALOUP TEST 1947-1
FIG. 1
CAR A-PFE 79999-OVERHEAD TANK BUNKERS
PRECOOLED TO 54°F. STD. REFRIG. SALTED 12½%
BUNKER CAPACITY BRAWLEY, 16% ICE ADDED YUMA
AVERAGE MELON TEMPERATURES
TOP LAYER
MIDDLE
BOTTOM
OUTSIDE AIR
START PRECOOLING
FINISH " "
FINISH PRECOOLING
AIR TEMPERATURES
TOP
BOTTOM
JUNE

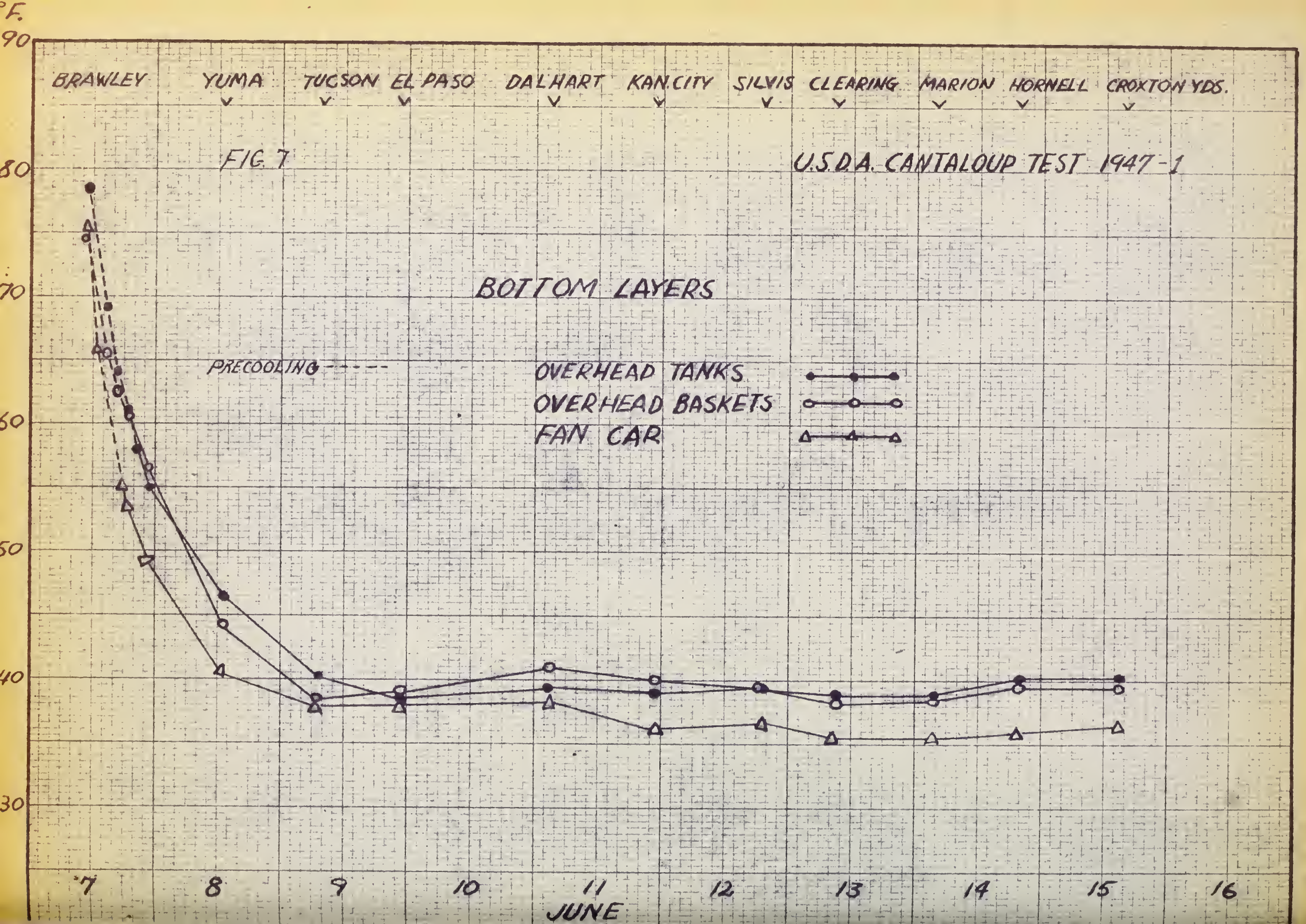

°F.
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROXTON YDS
U.S.D.A. CANTALOUP TEST-1947-1
FIG. 2
CAR B-PFE 79998-OVERHEAD BASKET BUNKERS
PRECOOLED TO 56°F., STD. REFRIG., SALTED 5% OF
ICE SUPPLIED BRAWLEY, 8% YUMA
AVERAGE MELON TEMPERATURES
TOP LAYER
MIDDLE
BOTTOM
AIR TEMPERATURES
TOP
BOTTOM
PRECOOLING FINISHED
90
80
70
60
50
40
30
7
8
9
10
11
12
13
14
15
16
JUNE

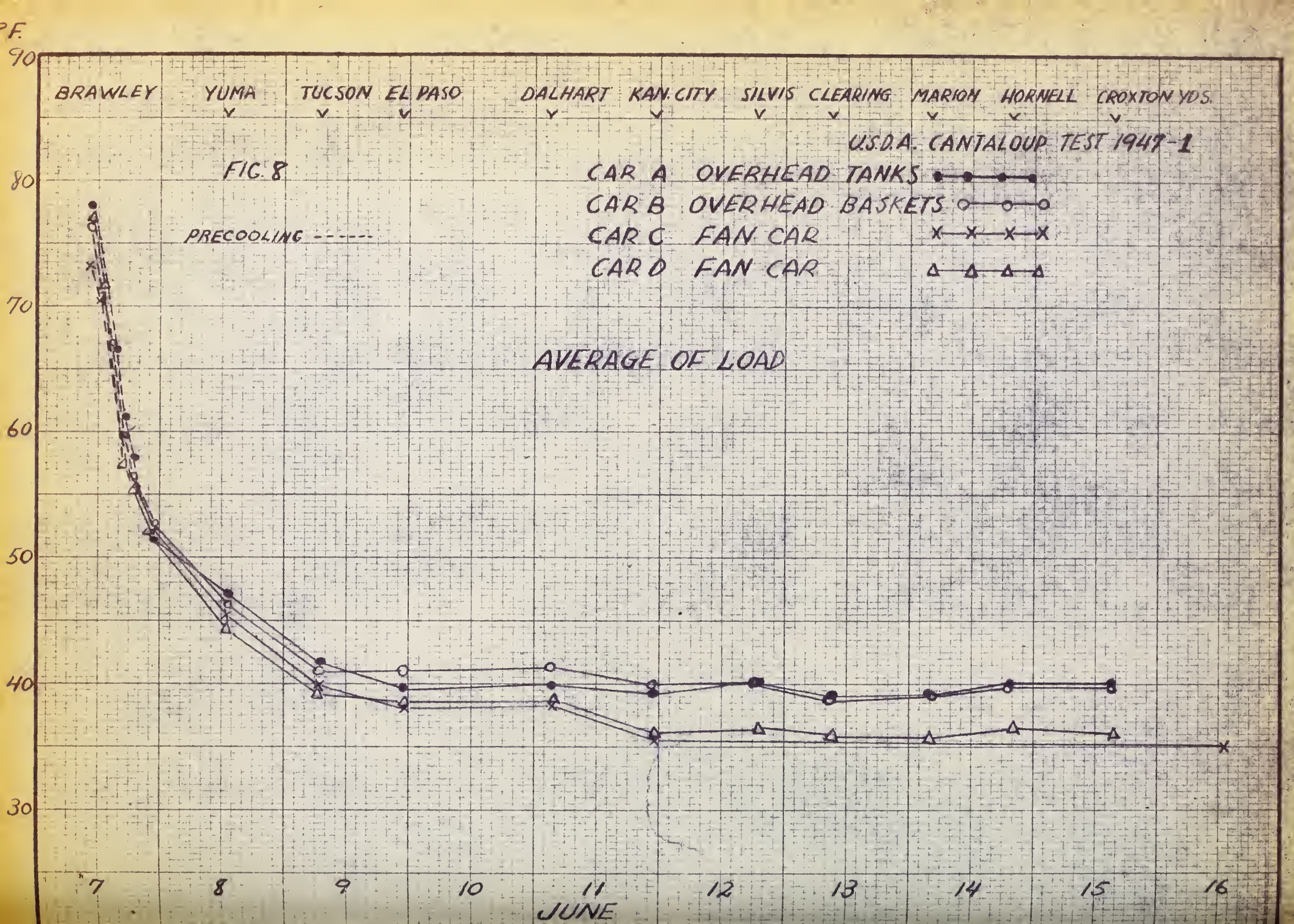

°F
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
CROXTON YDS.
U.S.D.A. CANTALOUP TEST 1947-1
FIG. 3
CAR C-PFE 64623-FAN CAR, PRECOOLED TO 57°F.
STD. REFRIG. 5% SALT-BRAWLEY, YUMA OF ICE
SUPPLIED.
AVERAGE MELON TEMPERATURES
TOP LAYER
MID "
BOT "
AIR TEMPERATURES
TOP
BOTTOM
PRECOOLING FINISHED
90
80
70
60
50
40
30
7
8
9
10
11
12
13
14
15
16
JUNE

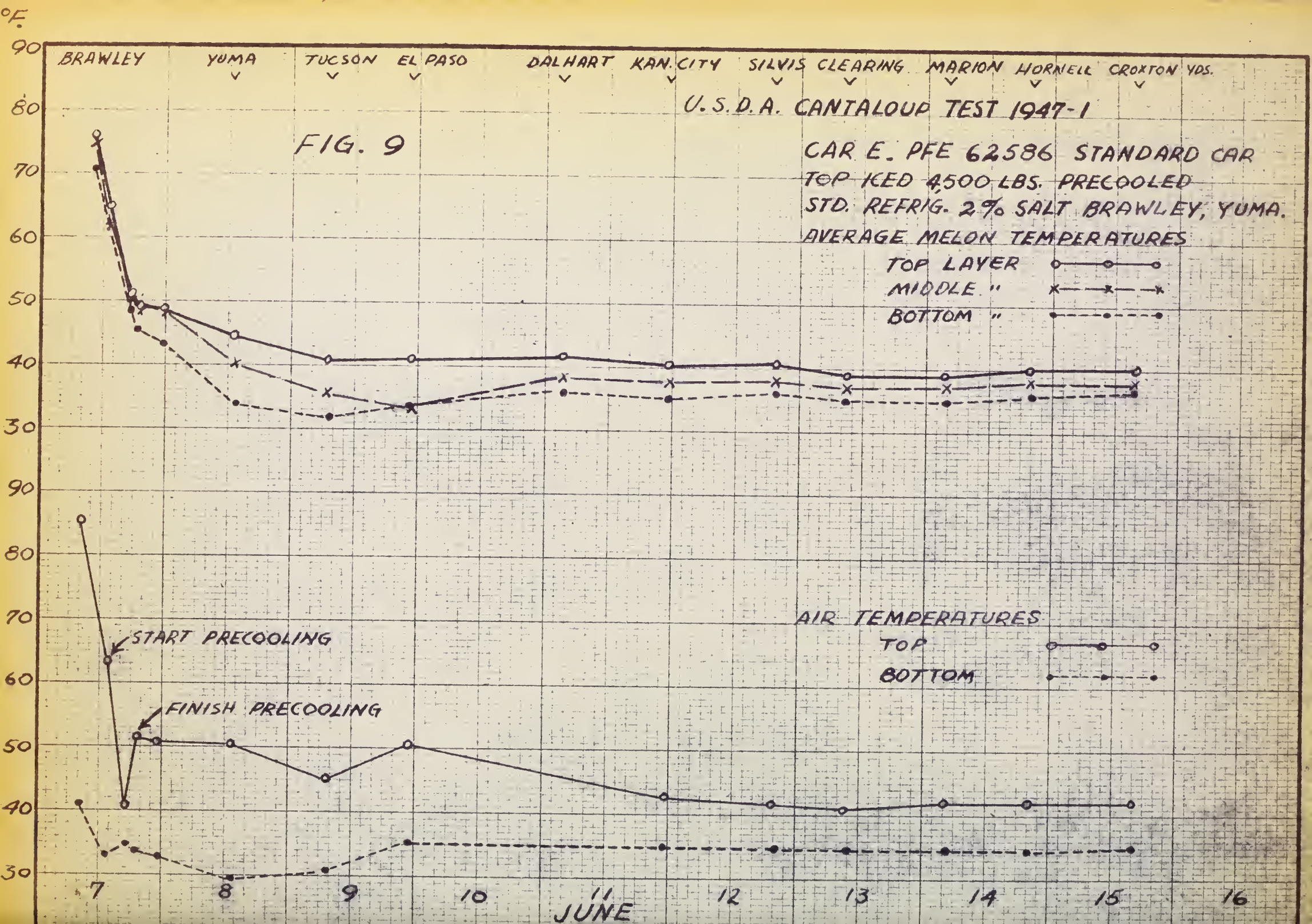

°F.
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROXTON YDS.
U.S.D.A. CANTALOUP TEST 1947-1
FIG. 4
CAR D-PFE 65778: FAN CAR. PRECOOLED TO 56°F. STD. REFRIG. 5% SALT BRAWLEY. YUMA OF ICE SUPPLIED
AVERAGE MELON TEMPERATURES
TOP LAYER
MIDDLE LAYER
BOTTOM LAYER
AIR TEMPERATURES
TOP
BOTTOM
PRECOOLING FINISHED
90
80
70
60
50
40
30
7
8
9
10
11
12
13
14
15
16
JUNE

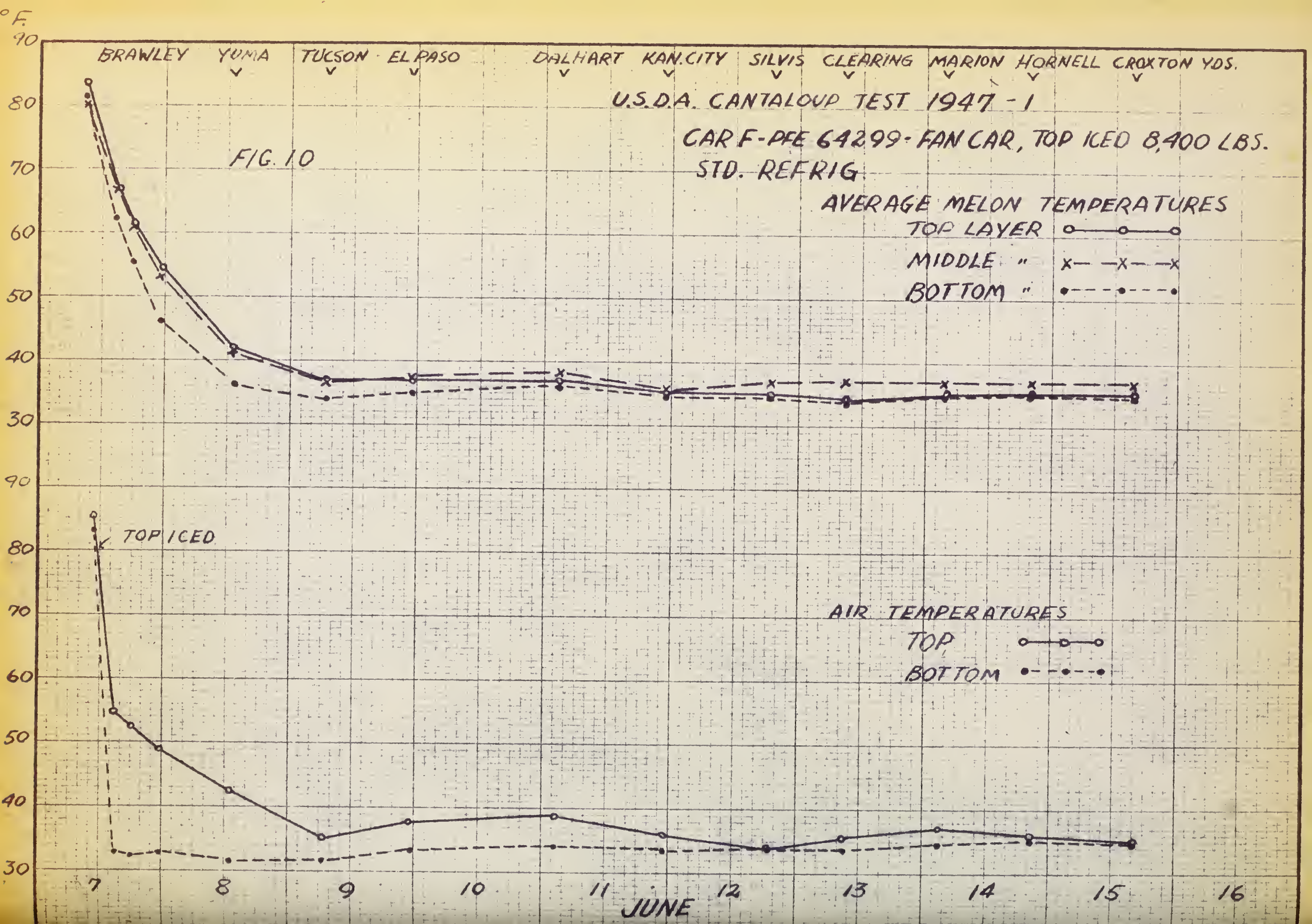

°F.
90
80
70
60
50
40
30
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROXTON YDS.
FIG. 5
U.S.D.A. CANTALOUP TEST 1947-1
TOP LAYERS
PRECOOLING
OVERHEAD TANKS
OVERHEAD BASKETS
FAN CAR
7
8
9
10
11
12
13
14
15
16
JUNE


°F.
90
80
70
60
50
40
30
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROXTON YDS.
FIG. 6
U.S.D.A. CANTALOUP TEST 1947-1
MIDDLE LAYERS
PRECOOLING
OVERHEAD TANKS
OVERHEAD BASKETS
FAN CAR
7
8
9
10
11
12
13
14
15
16
JUNE


°F.
90
80
70
60
50
40
30
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROXTON YDS.
FIG. 7
U.S.D.A. CANTALOUP TEST 1947-1
BOTTOM LAYERS
PRECOOLING - - - - -
OVERHEAD TANKS
OVERHEAD BASKETS
FAN CAR
7
8
9
10
11
12
13
14
15
16
JUNE


°F.
90
80
70
60
50
40
30
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROXTON YDS.
U.S.D.A. CANTALOUP TEST 1947-1
FIG. 8
CAR A OVERHEAD TANKS
CAR B OVERHEAD BASKETS
CAR C FAN CAR
CAR D FAN CAR
PRECOOLING ------
AVERAGE OF LOAD
7
8
9
10
11
12
13
14
15
16
JUNE


°F.
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROXTON YDS.
U.S.D.A. CANTALOUP TEST 1947-1
FIG. 9
CAR E. PFE 62586 STANDARD CAR
TOP ICED 4,500 LBS. PRECOOLED
STD. REFRIG. 2% SALT BRAWLEY, YUMA.
AVERAGE MELON TEMPERATURES
TOP LAYER
MIDDLE "
BOTTOM "
AIR TEMPERATURES
TOP
BOTTOM
START PRECOOLING
FINISH PRECOOLING
90
80
70
60
50
40
30
7
8
9
10
11
12
13
14
15
16
JUNE


°F.
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROXTON YDS.
U.S.D.A. CANTALOUP TEST 1947 - 1
CAR F-PFE 64299 - FAN CAR, TOP ICED 8,400 LBS.
STD. REFRIG.
FIG. 10
AVERAGE MELON TEMPERATURES
TOP LAYER
MIDDLE "
BOTTOM "
TOP ICED
AIR TEMPERATURES
TOP
BOTTOM
90
80
70
60
50
40
30
7
8
9
10
11
12
13
14
15
16
JUNE

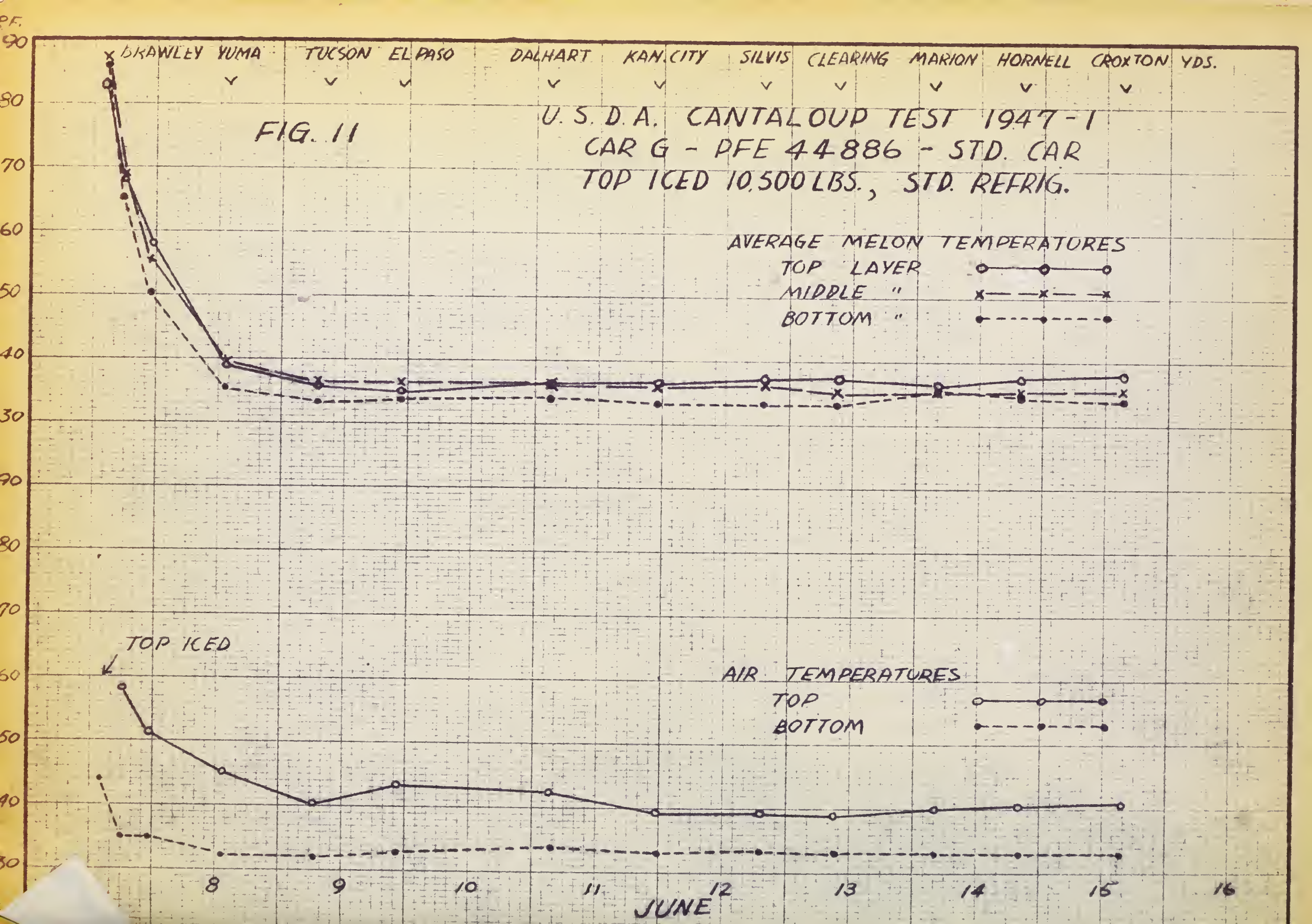
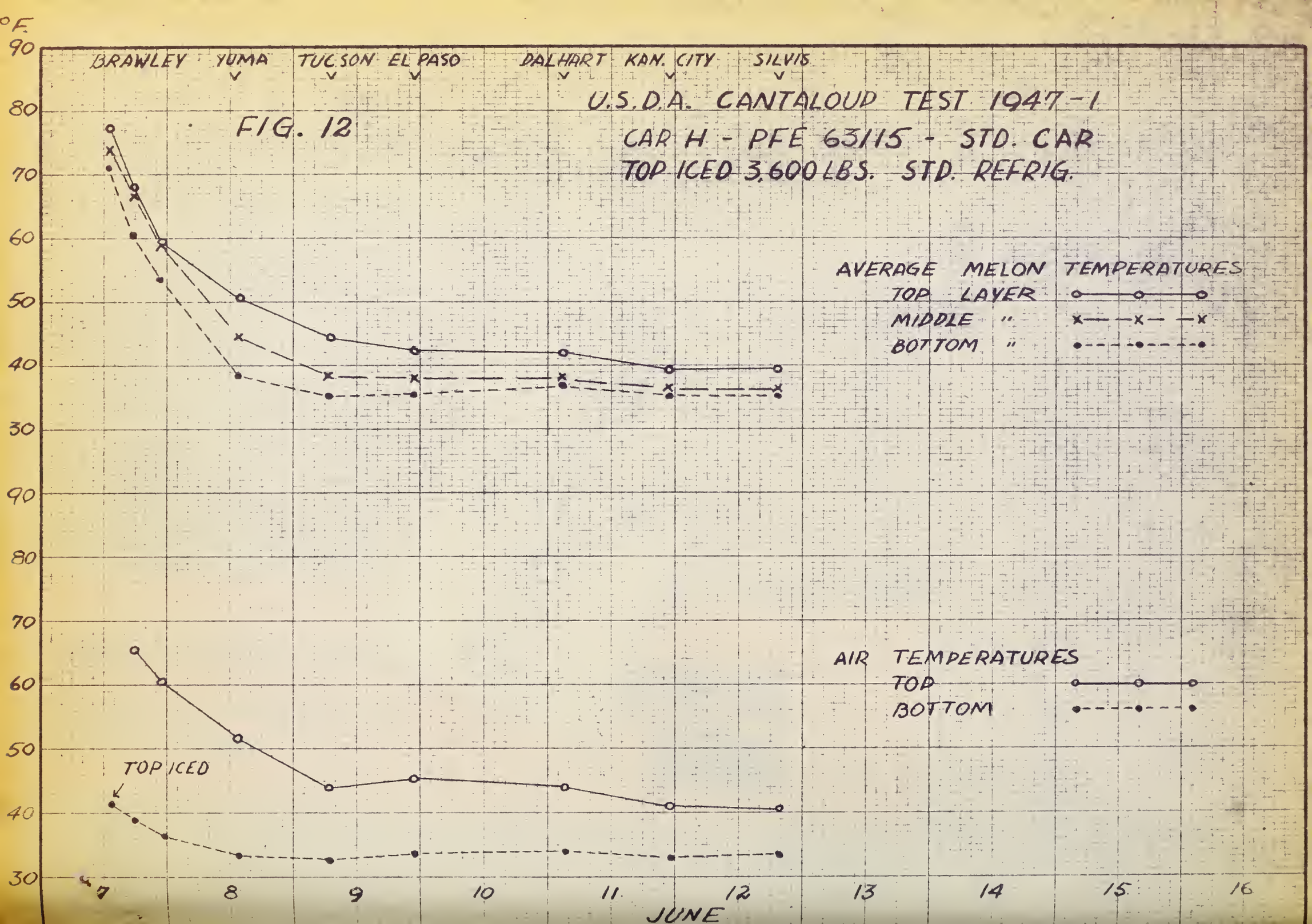


FIG. 11
U. S. D. A. CANTALOUP TEST 1947-1
CAR G - PFE 44886 - STD. CAR
TOP ICED 10,500 LBS., STD. REFRIG.
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
CLEARING
MARION
HORNELL
CROXTON YDS.
AVERAGE MELON TEMPERATURES
TOP LAYER
MIDDLE "
BOTTOM "
TOP ICED
AIR TEMPERATURES
TOP
BOTTOM
90
80
70
60
50
40
30
8
9
10
11
12
13
14
15
16
JUNE


°F.
BRAWLEY
YUMA
TUCSON
EL PASO
DALHART
KAN. CITY
SILVIS
U.S.D.A. CANTALOUP TEST 1947-1
FIG. 12
CAR H - PFE 63115 - STD. CAR
TOP ICED 3,600 LBS. STD. REFRIG.
AVERAGE MELON TEMPERATURES
TOP LAYER
MIDDLE "
BOTTOM "
AIR TEMPERATURES
TOP
BOTTOM
TOP ICED
90
80
70
60
50
40
30
7
8
9
10
11
12
13
14
15
16
JUNE